2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The proposed action is to construct and operate a new Health Protection Instrument Calibration Facility in B Area of SRS. The proposed facility would provide the laboratories, offices, equipment, and support space necessary for the SRS Instrument Calibration Program to be in compliance with applicable DOE orders and ANSI standards. The proposed action also represents a commitment made in the DOE-approved SRS Implementation Plan for DOE Order 5480.11.

The proposed calibration facility would be designed and constructed in accordance with DOE Order 6430.1A. This project has been determined to be in the Production Support (PS) design class. This classification applies to systems which handle radioactive materials, but which are not classified as nuclear safety class. The PS design category includes emergency response to all potential radioactive or hazardous chemical releases.

A Hazards Assessment has been conducted in accordance with the Interim Hazards Guide for Non-Reactor Facilities at the Savannah River Site, (WSRC, 1990) and is documented in the Functional Design Criteria. The proposed calibration facility has been classified as a General Support Nonnuclear Facility. The Facility Segment Use Category of the proposed calibration facility was determined to be General Use (Nadaeu, 1993). All applicable safety requirements of DOE orders and SRS standards and specifications would be incorporated in accordance with DOE requirements.

In addition to the physical construction of the proposed calibration facility this fiscal year 1992 line item project would also provide all laboratory calibration, repair and test equipment necessary to bring SRS into compliance with DOE orders. The total estimated cost for this project is currently set at $20.6 million dollars. Current project schedules have slated construction for this facility to begin in February 1994.

2.1.1 Facility and Process Description

2.1.1.1 Materials

The primary mission of the proposed calibration facility would be the inspection, calibration and maintenance of the radiation monitoring instruments used on SRS. In order to accomplish this mission it would be necessary for the proposed Health Protection Instrument Calibration Facility to maintain a number of radiation sources within the facility. The sources would include potentially hazardous amounts of radioactive materials including cobalt-60 (^{60}Co); strontium-90 (^{90}Sr); cesium-137 (^{137}Cs); promethium-147 (^{147}Pm); thallium-204 (^{204}Tl); californium-252 (^{252}Cf); tritium (^{3}H); and plutonium-239 (^{239}Pu). A complete listing of the source materials and their strength is listed in Table 2-1.

2.1.1.2 Facility

Preliminary designs (Title I) call for the proposed facility to be located in the northwest corner of B Area at SRS. This area was chosen for its central location on SRS and ease of access from all supported areas. The proposed facility would be a 22,000 square foot single story structure built on grade.

The majority of the exterior walls would be constructed of concrete block with an insulated metal panel roof. The interior walls would normally be gypsum board or concrete block. However, poured concrete would be utilized in those areas where radiation shielding was required. Some laboratories would require wells or pits as deep as 20 feet below grade for radiation source positioning and storage. The facility would have 50 paved parking spaces to accommodate employee, facility, and visitor vehicles.

Table 2-1

Radiological Calibration Sources and Quantities for the Proposed Instrument Calibration Facility.

NUCLIDE	MAXIMUM ACTIVITY	LOCATION
	SEALED SOURCES	
^{60}Co	6,000 Ci (*)	Gamma Beam Room
^{60}Co	600 Ci	Gamma Beam Room
^{60}Co	60 Ci	Gamma Beam Room
^{137}Cs	5,000 Ci	Gamma Beam Room
^{137}Cs	500 Ci	Gamma Beam Room
^{137}Cs	50 Ci	Gamma Beam Room
^{60}Co	20 Ci	Low Scatter Room
^{137}Cs	20 Ci	Low Scatter Room
^{137}Cs	10 Ci	Low Scatter Room
^{137}Cs	2 Ci	Low Scatter Room
^{252}Cf	4 mg	Low Scatter Room
^{252}Cf	1 mg	Low Scatter Room
^{252}Cf	100 µg (**)	Low Scatter Room
^{137}Cs	1.2 Ci	Panoramic Irradiator
$^{90}Sr/Y$	100 mCi (***)	Beta Beam Room
^{147}Pm	30 mCi	Beta Beam Room
^{204}Tl	1 mCi	Beta Beam Room
^{60}Co	5 Ci	Gamma & Neut. Well
^{137}Cs	10.5 Ci	Gamma & Neut. Well
^{252}Cf	10 µg	Gamma & Neut. Well
^{137}Cs	1 mCi	Envr. Testing Lab
	GASEOUS SOURCES	
^{3}H	600 µCi	Tritium Room
	ELECTROPLATED SOURCES	
^{239}Pu	8 µCi (****)	Alpha & Beta Room
	GENERATED SOURCES	
X-Rays		X-ray Beam Room

(*) (Ci=Curie). The standard unit in measuring radioactivity, equal to the quantity of any radioactive material in which the number of disintegrations per second is 3.7×10^{10}.

(**) (µ = micro). The unit of measure used to express the form of one millionth part of; the factor 10^{-6}.

(***) (m = milli). The unit of measure used to express the form of one thousandth part of; factor or 10^{-3}.

(****) Maximum total activity of all 50 electroplated sources.

The proposed calibration facility would have the following areas: gamma beam laboratory, low scatter laboratory, panoramic irradiator laboratory, beta beam laboratory, gamma & neutron well, tritium laboratory, alpha & beta laboratory, x-ray laboratory, central control room, performance testing and evaluation laboratory, radiation counting laboratory, receiving and decontamination room, wrapping and quality control room, Electrical and Instrumentation (E&I) shop, machine shop, conference room, records room, vehicle bay, offices, heating ventilation and air conditioning equipment room, rest rooms/locker rooms, and storage rooms.

Facility construction would require "tie-in" to the B Area domestic water system, electrical supply grid, fire suppression water system, and domestic sewer system. Line Item 91-D-145, New Whole Body Counter Facility, would extend B Area utilities to the west side of SRS Road #2 providing tie-in points for this facility. Liquid effluent from the facility rest room sinks, commodes, water fountain drain, laboratory sink drains, and a lunchroom sink drain would be directed to the sanitary sewer. The roof, parking lot, and grounds would lead rainwater runoff to a storm sewer.

2.1.1.3 Process

The proposed calibration facility would provide a central site location for the SRS Instrument Calibration Program. The new calibration facility would also provide procurement, testing, and evaluation services for all new SRS radiation monitoring equipment. A typical routine for the new calibration facility would be as follows. Instruments requiring service would be picked up with a facility vehicle and delivered to the proposed calibration facility. Upon arrival, the subject instruments would be logged in with a bar code scanner and surveyed for radioactive contamination (decontamination would occur as necessary). Instruments being returned for repair would be forwarded to the E&I shop for Central Services Works Engineering personnel to repair. Some types of instruments returned for routine calibration would have a set of "As Found" readings taken utilizing an appropriate source to determine if the response of the instrument was within required limits. The instrument would then be taken to the E&I shop for maintenance. Following maintenance, the instrument would be calibrated and delivered to the user organization.

2.2 Alternative Actions

2.2.1 No Action

An alternative to the proposed action is to take no action. In accordance with the National Environmental Policy Act (NEPA: 40 CFR 1502.14(d)), the "No Action" alternative is included to provide a baseline condition from which to evaluate the potential environmental impacts of the proposed action. This alternative, by definition, would consist of DOE-SR taking no action to construct a new calibration facility or to upgrade the existing SRS Instrument Calibration Facility so that it complied with existing DOE orders. This would result in a failure to meet both the purpose and need for agency action.

2.2.2 Renovate the Existing Calibration Facility

An alternative to constructing a new facility would be to renovate the existing calibration facility. This is not considered as an acceptable alternative as renovation is neither practical nor cost-effective. The existing facility is too small to provide space for all of the equipment necessary to meet DOE Orders 5480.4 and 5480.11. Renovation of the existing facility is also not considered as a practical alternative because the walls contain asbestos. Modifications to walls containing asbestos would be difficult and costly. This facility is further restricted by the amount of shielding and electrical supply. Given the nature of the safety concerns, and cost associated with renovation of the existing facility, it is not considered to be a reasonable option.

2.2.3 *Expansion of the Existing Calibration Facility*

An alternative to constructing a new facility would be the expansion of the existing calibration facility. This is not considered to be an acceptable alternative because expansion of the existing facility is hampered by too many mitigating factors. Existing roads, underground utilities, and buildings adjacent to Building 736-A preclude construction of an annex. This facility is further restricted by its physical location to a surrounding working populace. Given the nature of the severe growth restrictions associated with the existing facility, expansion is not consider as a reasonable alternative.

2.2.4 *Alternative Construction Sites*

Another alternative to the proposed action was the construction of the proposed facility in the SRS 700 Area. The 700 Area is composed of the SRS Administration Area (A Area), the Savannah River Technology Center (SRTC), the Savannah River Ecology Laboratory (SREL), and the Fuel and Target Fabrication Facility (M Area). This proposal was initially examined for the convenience of having the proposed facility located in the same general area as the existing instrument calibration facility. However, due to space limitations with the 700 Area and elevated background radiation levels associated with the operation of SRTC and the Fuel Fabrication Facility, it was determined that the proposed facility would be better served by locating it away from operational Radiologically Controlled Areas (RCAs). Accordingly, this alternative was not considered as favorable as the proposed action in providing an optimum setting for the operation of the proposed instrument calibration facility.

2.2.5 *Use of Offsite Calibration Facilities*

Another possible alternative to the proposed action is the use of offsite vendors to perform the calibration of SRS instrumentation. This alternative was investigated and considered to be an unreasonable option for the following reasons:

- A major project objective, complying with DOE Order 5480.4 and the DOE Radiological Control Manual (DOE/EH-0256T), could not be met. These documents require that instrument calibrations be performed in accordance with ANSI N323. No commercial facilities have to date been identified that could comply fully with the ANSI N323 instrument calibration requirements. The nearest fully qualified DOE calibration facility was determined to be at the Hanford Site.

- Offsite calibration organizations were not capable of providing timely support for emergency situations where the demand for instrument services can be very high.

- The existing contract with Eberline Instruments, Columbia, SC, was established primarily for calibration of the 124 high-range gamma instruments which could not be adequately calibrated using current SRS irradiators. This contract is expensive and difficult to manage because of the high resource loading of Calibrations staff needed to support it. The cost for the first 13 months of the contract was $45,956. The total cost for similar partial services for the remaining 5,000 portable radiation monitoring instruments in the SRS inventory would be proportionately higher (approximately $1.7M per year). Several additional weeks are added to the turnaround time (one week for in-house services) for each instrument in order to accommodate the SRS requirements for:

  - Thoroughly monitoring each instrument for contamination and clearing them for offsite shipment.
  - Preparing the paperwork for shipping and receipt.
  - Performing QC verifications using SRS gamma irradiators for each instrument following vendor calibration.
  - Performing the time consuming Subcontract Technical representative functions required to support the contract.
  - Transporting instruments to/from the vendor's facility using SRS staff and vehicles.
  - Coordinating accounting duties to verify invoice accuracy and to authorize payments.

- In order to ensure the availability of an adequate supply of calibrated instruments to support routine SRS operations, the current inventory would need to be increased significantly because of the larger number of instruments that would not be in service at any given time.

- Most instruments used at SRS require repairs prior to recalibration. Because instrument manufacturers provide repair services only for their own equipment the SRS program would still require a dedicated instrument repair staff.

3.0 AFFECTED ENVIRONMENT

A comprehensive discussion of SRS and associated environs is presented in the Reactor Operation Environmental Impact Statement (ROEIS) (DOE, 1990), and in the Reactor Operation Environmental Information Documents, Volumes I-III (WSRC, 1989a, 1989b & 1989c).

3.1 Geography, Demography, and Socioeconomics

The SRS encompasses approximately 80,535 hectares (ha) (199,000 acres) in southwestern South Carolina. The SRS borders the Savannah River for about 27 km (17 mi). Figure 3-1 shows SRS in relation to major population centers, with the closest being Augusta, Georgia, and Aiken and Barnwell, South Carolina. Figure 3-1 also shows the six-county area of South Carolina and Georgia where approximately 83 percent of the current SRS work force resides. In 1988, the six-county population was 425,000 including a six county region work force of 191,364. In 1989, approximately 15,000 SRS workers, or about 8 percent of the available work force, resided in the six-county area. The ROEIS (DOE, 1990) and the most recent socioeconomic survey of the six-county SRS area of influence (NUS, 1990) contain additional information.

The proposed actions subject for review under this EA would occur in B Area of SRS. B Area is depicted in relation to SRS in Figure 3-2. The proposed facility would be located on a 1.2 ha plot immediately adjacent the developed portions of B Area. This location is approximately 4.4 km from the nearest SRS site boundary.

3.2 Meteorology and Climatology

The SRS has a temperate climate with mild winters and long summers. The region is subject to continental influences, but is protected from the more severe winters in the Tennessee Valley by the Appalachian Mountains to the north and northwest. Gently rolling hills with no unusual topographic features that would significantly influence the general climate characterize SRS and the surrounding area. The meteorological and climatological data for SRS contained in this section are representative of that for the proposed Health Protection Instrument Calibration Facility location. The Reactor Operation Environmental Information Document, Volume III, (WSRC, 1989c) contains additional information on SRS meteorology and climatology.

3.2.1 Average Wind Speed and Direction

The average wind speed for the period of 1982 to 1986, from onsite data, was 3.25 meters per second (m/s) (10.66 ft/s). Hourly wind speeds less than 2 m/s (6.5 ft/s) occurred about 9 percent of the time. For about half of the time, wind speeds were less the 4 m/s (13.1 ft/s). From 1975 to 1979, from onsite data, the average wind speed was greatest during the winter (3.35 m/s) and least during the summer (2.48 m/s).

Data collected from H Area, which is near the center of SRS, indicate that observed wind directions tend to favor the southwest and northeast quadrants (28 and 30 percent of the time, respectively) in relation to the northwest (20 percent) and southeast (22 percent) quadrants. For all data, winds from the northeast sector occurred most frequently (nearly 10 percent of the time). That is, emissions would have been transported toward the southwest more frequently than toward any other direction. Winds from direction sectors in the southwest quadrant also occurred with a relatively high frequency (7 to 8 percent of the time) (DOE, 1990).